## CLAIMS

- 1. A ruthenic acid nanosheet having a thickness of 1 nm or smaller.
- 2. The ruthenic acid nanosheet in accordance with claim 1 represented by the formula (1):

$$[RuO_{2+0.5x}]^{x-}$$
 (1)

- 3. A layered ruthenic acid compound comprising a layered structure of the ruthenic acid nanosheets in accordance with claim 1 or 2.
- 4. The layered ruthenic acid compound in accordance with claim 3 having an X-ray diffraction peak intensity at a (00L) plane (L = 1 to n when  $0 \le \theta (\text{CuK}\alpha) \le 90^{\circ}$ , n is determined depending on a basal interplanar spacing and  $5 \le n \le 35$ ).
- 5. A colloidal ruthenic acid compound containing the ruthenic acid nanosheet in accordance with claim 1 and/or the layered ruthenic acid compound in accordance with claim 3 and a solvent.
- 6. An electrochemical device having an electrode comprising the ruthenic acid nanosheet in accordance with claim 1.
- 7. A method of producing a ruthenic acid nanosheet comprising the steps of:
- (a) mixing ruthenium oxide and an alkali metal compound and sintering or melting the resulting mixture to obtain a layered alkaline metal-ruthenate compound containing

a ruthenic acid nanosheet having a thickness of 1 nm or smaller;

- (b) treating said layered alkaline metal-ruthenate compound in an acidic solution to exchange at least part of alkali metal with proton to obtain a protonic layered ruthenic acid hydrate;
- (c) reacting said protonic layered ruthenic acid hydrate with alkylammonium or alkylamine to obtain a layered alkylammonium-ruthenic acid intercalation compound; and
- (d) mixing said layered alkylammonium-ruthenic acid intercalation compound with a solvent to obtain a colloid containing a ruthenic acid nanosheet having a thickness of 1 nm or smaller.
- 8. A method of producing the ruthenic acid nanosheet in accordance with claim 7, wherein ruthenium oxide and alkali metal salt are mixed and the resulting mixture is sintered at  $700-900\ ^{\circ}$  in the step (a).
- 9. A method of producing the ruthenic acid nanosheet in accordance with claim 7, wherein ruthenium oxide and alkali metal hydroxide are mixed and the resulting mixture is melted at 500-700  $^{\circ}$ C in the step (a).
- 10. A method of producing the ruthenic acid nanosheet in accordance with claim 7, wherein said protonic layered ruthenic acid hydrate is reacted with alkylammonium represented by  $(R)_mNH_{4-m}$  or  $(R)_{m-p}(R')_pNH_{4-m}$  (where R and R' are  $CH_3(CH_2)_q$ , respectively, m=0 to 4, p=0 to 3 and q=0 to

- 18) in the step (c).
- 11. A method of producing the ruthenic acid nanosheet in accordance with claim 7, wherein said protonic layered ruthenic acid hydrate is reacted with alkylamine represented by  $(R)_mNH_{3-m}$  or  $(R)_{m-p}(R')_pNH_{3-m}$  (where R and R' are  $CH_3(CH_2)_q$ , respectively, m = 0 to 3, p = 0 to 2 and q = 0 to 18) in the step (c).
- 12. A method of producing the ruthenic acid nanosheet in accordance with claim 7, wherein said layered alkylammonium-ruthenic acid intercalation compound is mixed with at least one solvent selected from the group consisting of water, alcohol, acetonitrile, dimethyl sulfoxide, dimethylformamide and propylene carbonate to obtain a colloid in the step (d).